

Photographic Chemicals

Working in a science museum and caring for a photography collection alerted me to a number of questions about photographic chemicals, because they were often perceived as problematic by widows and children clearing out a deceased amateur photographer's belongings. Were these chemicals still useful to anyone? Were they poisonous? Would the museum collect them? What should they do with them? Sometimes the bottles and boxes stamped with shop addresses provided traces of where the photographer had been to get his supplies, which could be contrasted to the much more distant and dispersed suppliers in these days of online shopping that modern home developers had to source their chemical supplies from. These two strands of common enquiries to curators of photography collections framed my approach to this chapter.

Why am I looking at this?

Although the analysis of amateur photographs and albums has provided much meat for discussion of family life and the domestic environment as well as the role of photographs in them, surprisingly little has been written about the pursuit of photography and home darkrooms, as the literature review showed. There are many facets of social history, histories of science and technologies, that could be explored through studying domestic darkrooms. This chapter is not the place to attempt to cover everything related to this practice, but developing photographs is an interesting scenario to examine when considering users of chemicals in the home.

The development of ones own photographs, instead of sending them to a mass production outfit, has generally been considered 'technical' photography, which as it was practiced by men and thought unappealing to women, became a gendered activity. The decline in developing photographs at home has been attributed to increasing difficulty in obtaining chemicals (has it? Reference? Or clarify that it has been colloquially, in passing, off hand attributed to this cause), so this chapter will explore the chemicals used, whether they become harder to get and the reasons this may have been the case.

Why does this matter?

Although operating a home darkroom can be considered a hobby that few people pursued, restricted to those who had the financial means and the physical space, not to mention the will to apply themselves to an experimental activity, this pastime brought chemicals into the home. They could be used for their developing capabilities, but also could be put to other uses in the domestic environment. The presence of some of these chemicals could also constitute a threat to health, whether human, animal or environmental, if they were mishandled, or misused. Having a better understanding of the ways that these chemicals were used legitimately for hobbies and general household purposes (where applicable) adds detail to the picture that this thesis is building up of the different users of chemicals in the British home. In doing so, the apparent restriction, withdrawal or concealment of chemicals for this purpose can be viewed and compared to other chemicals that were also available for other domestic purposes. Was there anything different about these chemicals, or about their users, that led to the perception that these chemicals became harder to get?

What resources will be used to investigate this?

Similarly to the methods used for other chapters, specialist magazines such as *The Amateur Photographer*, instructional books as well as references to photographic chemicals found in newspapers and government discussions will form the basis of the content, supplemented by user memories obtained through oral history recordings.

Dave Kenyon has written about the consistency of content in weekly magazine *The Amateur Photographer* when he sampled 1930s and 1990s copies. He classified the feature articles as consumer information, photographic techniques, individuals' working methods and their results, making money from photography, which in addition to a large proportion of advertising, made consumption a principle feature of the magazine. Kenyon identified photography as part of the 1930s wave of consumerism for the lower middle classes, and justified the consumer focus of the magazine.¹

In addition to the documentary sources used in other chapters, I will also draw upon museum collections, including those of Science Museum Group (SMG) northern members, the National Media Museum (NMeM) in Bradford, the Museum of Science and Industry (MOSI) in Manchester and a National Trust Property in Liverpool known as The Hardman's House. The Hardman's House which belonged to a married couple, Chambre and Margaret Hardman who as professional photographers ran a portrait studio there and made it their home. The property is described as a 1950s time capsule, so only items that were in the house are present, and no active addition has taken place although the collection may have been managed through disposal. In this house, photography and photographic processing was an activity pursued by both, so the idea that it was a sharply demarcated gendered activity is immediately challenged. The distinction between professional premises and domestic home is of particular interest in the context of this thesis.

NMeM has been part of the SMG since its inception, and MOSI was merged into the group in 2011. As a national museum, NMeM collected items with national significance or provenance, whereas MOSI focused on items that were made or had compelling use stories in the Greater Manchester area and where appropriate, referred offers of object donations to NMeM. Kodak products are particularly well represented at NMeM, as the company's donated its whole collection in order to prevent it being dispersed and many of these objects feature in the Kodak gallery. MOSI's Collected Cameras exhibition was dismantled in 2012, and displayed similar objects to the Kodak gallery. Both museum's featured items used by amateurs as well as professional photographers, and for this reason the museum collections are relevant to this thesis.

Which chemicals are we talking about?

Photographic chemicals, particularly cyanide of potassium, worried a former president of the British Pharmaceutical Society E.T. Neathercoat so much that he urged photographers to 'let your local chemist deal with all dangerous photographic solutions'.

Flash powder =

1 Kenyon, Dave. *Inside Amateur Photography*. Batsford Cultural Studies, 1992. p65-66

hypo =

cyanide

Who used photographic chemicals at home?

While instruction manuals and magazines portrayed a domestic darkroom as being not necessarily being permanently static, large or expensive, in an attempt to encourage more photographers to try developing their photographs at home, it remained a minority activity that was thought to be most often pursued by adolescent and young men. Neathercoat imagined 'innocent-looking' cyanide sticks 'in the hands of an enthusiastic, unsuspecting schoolboy' and the 'possible calamity to himself and to others'.² Although photography was stressed as not having to be an expensive hobby which made it suitable for schoolboys, it did require investment in camera, film, measures, a thermometer, trays, bowls, clips, as well as paper and chemicals and the space in which to work, which restricted the pastime to people who could afford to make this outlay. Zoe Dominic was given a camera as quite a young child and described her "solid middle class family" complete with day and night nurseries and a battery of live-in staff. Similarly, as the son of two doctors Oliver Sacks cultivated a childhood passion for developing and colouring photographs at home,³ fits the profile of a typical middle to upper middle class child for whom this type of expenditure was not problematic.

In the displays at NMeM, home darkrooms are not depicted as a cheaper alternative to sending film away despite pointing out that when Kodak first offered this service it was expensive, costing the equivalent of around two weeks wages for an average working man. By the 1930s, it was not necessarily always more economical to process film at home, and the activity was promoted as an interest, although this view was not held by all authors who described photographers who handed off their films for developing and printing as "lazy" or "ignorant".⁴ However, what was affordable or considered value for money would of course vary from user to user. Nevertheless, by inference, users of photographic chemicals could be classified as not-lazy, and not-ignorant, as well as careful, meticulous and methodical.

Johnsons of Hendon advertised heavily, often on the front page of *The Amateur Photographer*, promoting the scales logo as the brand to look out for, as well as proclaiming their chemicals availability and affordability. It might have been expected that the war would have disrupted supplies for hobbyists, but Johnson were keen to emphasise that this was not the case, unlike Kodak who had to announce that their plates, papers, film, cameras and accessories (though they did not mention chemicals) were under the Limitations of Supplies Orders, so harder for civilians to obtain.⁵ Selo turned night-time confinement to their advantage, using it to promote a new highspeed film and lighting equipment for indoor photographs, urging people to make "Black-out

2 Neathercoat, E.T. "Poisons in the Home." *The Daily Mail*, 02 January 1926, 6.

3 Dominic, Zoe. "Oral History of British Photography." By Shirley Read (1996), track 2 of 8, 12.00; Sacks, Oliver W. *Uncle Tungsten : Memories of a Chemical Boyhood*. 1st ed. New York: Alfred A. Knopf, 2001.

4 Bowler, Stanley W. *Photography for Boys and Girls*. A Junior Teach Yourself Book. Liverpool: English Universities Press Limited, 1950.

5 Selo. "Black-out Time Is Photograph Time." *The Amateur Photographer* (01 January 1941): iv. Chemists, Johnson & Sons Manufacturing. "Advertisement." *The Amateur Photographer* XCIV, no. 2926 (06 December 1944): front page.

Time your Photograph Time".⁶

It is no doubt very satisfying to be able to acquire the best that money can buy, but even the wealthiest amateur cannot obtain photographic chemicals better, purer or more perfectly compounded than JOHNSONS CHEMICALS

You can luxuriate in the knowledge that, here at any rate, you and the millionaire are on an equal footing. The fixed selling prices of all the chemicals made by Johnsons of Hendon are modest in the extreme and in the reach of everyone who uses a camera.⁷

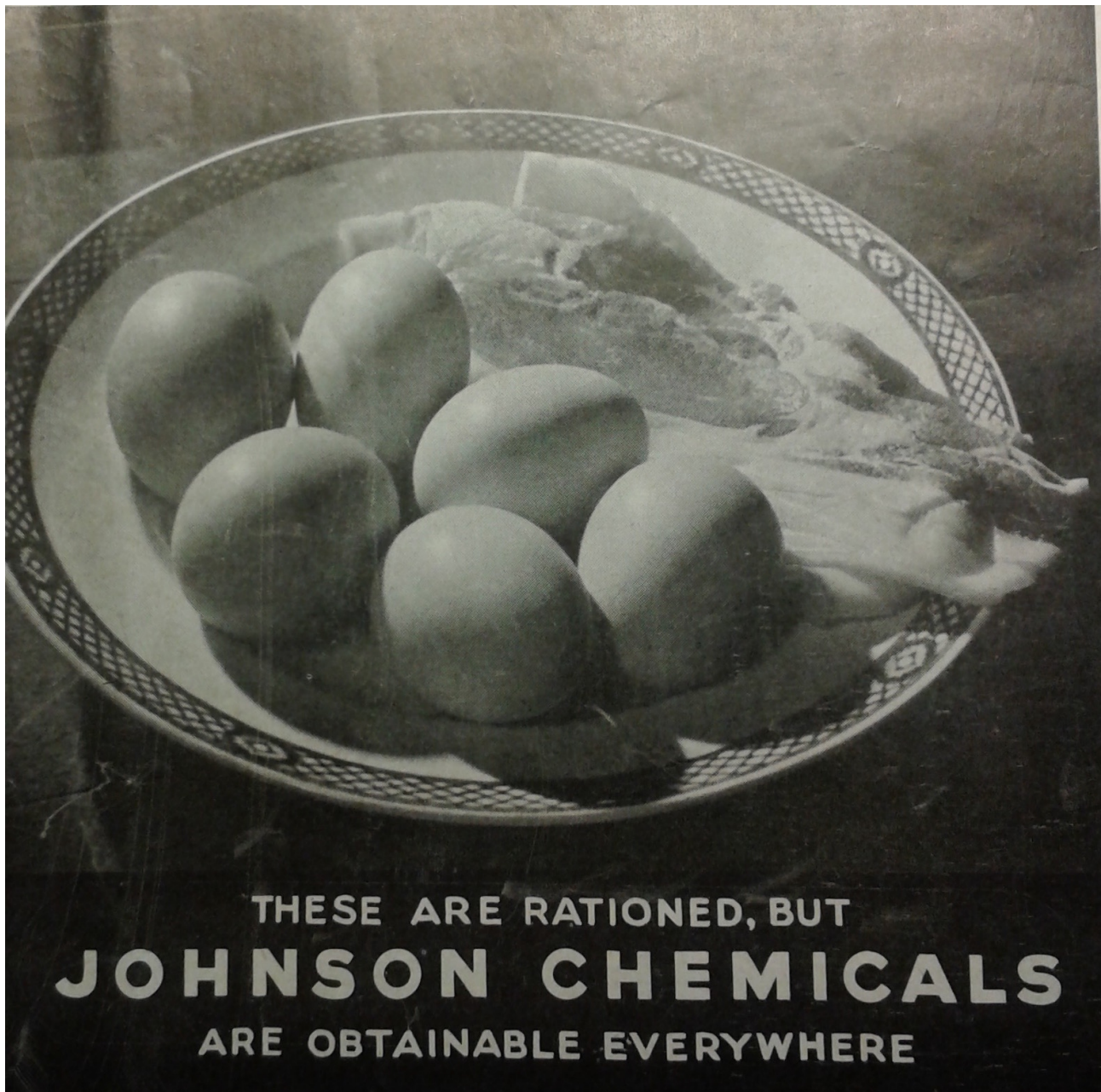


Illustration 1: Although staple food items were rationed, people could continue their hobby unhindered.

⁶ Selo. "Black-out Time Is Photograph Time." *The Amateur Photographer* (01 January 1941): iv.

⁷ Johnson & Sons Manufacturing Chemist. "Advertisement." *The Amateur Photographer* XCIV, no. 2882 (02 February 1944): front cover.

Developing	
Roll films – spools up to 8 exposures	6d
Fine grain development	9d
Leica, Retina or similar spools	1/6
Films packs/ plates all sizes up to 3.5 x 2.5	2/-dozen
Printing	
Plates/ packs all sizes up to 3.5 x2.5	2/- dozen
Spools in strips of 3	3/-
Enlarged postcards (black)	4d each
Enlarged postcards (sepia)	6d each

*Table 1: Selected developing and printing prices, April 1938 JT Chapman Ltd, Manchester(MOSI)
Should now of course compare this to prices for chemicals*

1943	Metol- Hydroquinone developer	(to make conc stock soln) 10oz 1/- 80oz 2/3 1 gall 3/9		
1943	Lists Ilford chemicals Sodium Bisulphite Sodium carbonate (anhydrous) Sodium carbonate (crystals) Sodium hyposulphite Sodium Metabisulphite	1lb 2/3 1lb 2/- 1lb 1/6 1lb -/9 1oz -/9 (1lb 2/3)		
1949	Potassium bromide potassium ferricyanide potassium metabisulphite			
1949	Metol- Hydroquinone dev	(to make conc stock soln) 10oz 2/- ½ gall 3/3 1 gall 6/3		
1953	Phenidone – new, landmark, instead of metol. Available for those who prefer to compound their own. Activates hydroquinone at lower concentration than metol. Better keeping/longer dish life. No need for 'obnoxious' caustic alkali required for metol. Lower exhaustion rate. One of least toxic developers, unlikely to cause dermatitis with	¼ oz 5/- 1 oz 14/3 2 oz 24/9, 4 oz 42/9 1 lb 141/9 4 lb 546/-		

	normal users, sufferers of metol poisoning able to use Phenidone-hydroquinone developer. Less staining than MQ (not avoidable completely). ⁸			
1953	<p>PFP developer – phenidone-hydroquinone. 40 oz make stock soln</p> <p>PQ universal developedconcntrated liquid, phenidone hydoquinone, dilute to instructions</p> <p>hypo</p>	<p>(working strenght) 40oz 9d 1 gall 2/6</p> <p>(stock solution) 8 oz 2/9 20 oz 4/6</p> <p>1 lb 1/6</p>		
1954	<p>PFP developer – phenidone-hydroquinone. 40 oz make stock soln</p> <p>PQ universal developer concntrated liquid, phenidone hydoquinone, dilute to instructions</p> <p>hypo</p>	<p>(working strenght) 40oz 1/- 1 gall 2/6</p> <p>(stock soln) 8oz 3/3 20oz 5/-</p> <p>1lb 1/9</p>		
1960	Monophen - now you can develop and fix your films in one simple operation. foolproof, easy, revolution, Ilford the people who bring simlicity to photography. One bottle of Monophen - all	8s 9d for 500cc poly-tainer sufficient for processing 12 films.		

⁸"Ilford Phenidone: A Remarkable New Developing Agent." United Kingdom: MOSI, 1953.

	you need. Monophen does the rest.... no more need for mixing messy chemicals, no clock watching, no accurate temperatures. child's play. impossible to over develop. short washing time. answer to tedium of processing. ⁹			

Table 2:

In a display on flash photography, amateur photographic chemical users are described as "adventurous" and "keen", and willingness to use explosive illumination sources indoors does suggest adventurous, if not somewhat foolhardy as the powder could not always be relied on to behave as expected. However, should the flash powder injure the user, they were depicted as 'unfortunate' or 'unlucky' with the chemical purely held to blame, rather than user error in storing, measuring out or igniting it.

At NMeM darkroom users competitive, depicted in association with photographic competitions run by societies. The layer of complexity that home processing opened up, increased creative scope beyond composition and lighting. This helps to build a picture of artistic, competitive users, who skilfully manipulated images, as well as chemicals. NMeM show that women were members of some photographic societies, but emphasise their minority status and state that "relatively few had the time or money to devote to photography as a serious hobby". This statement was not supported by an accompanying image of a woman working in a well equipped darkroom, although she could have been employed to work there.

Historian Erika Hanna suggested that the technical aspects of 20 century home processing allowed men to carve out a niche in a hobby where manufacturers had been perceived increasingly as catering to women, with lighter, easier to use cameras and frivolous colour snaps.¹⁰ The technicality

9 "Ilford Monophen." In *Ilford Trade Lit 2: MOSI*, 1960.

10 Hanna, Erika. "Reading Irish Women's Lives in Photograph Albums." *Cultural & Social History* 11, no. 1 (2014): 89-109.

of home processing is one that can be engaged with on various levels, provided that kits did not completely displace pure photographic chemicals. However, testimonies from photographers suggest that girls and women could be just as enchanted or obsessed by darkroom processes. For example, Zoe Dominic was given a camera as a child and kept her chemicals in her bedroom. She set up darkrooms wherever she lived as a young adult in the 1950s, squeezing into wardrobes full of clothes to load films and using bathrooms to process images.¹¹

'Magic' is a word often used to encapsulate the appeal of home processing, the magic of the darkroom as experienced by Paul Carter, or what Zoe Dominic thought of as 'pure magic', being 'the best moment in the darkroom when the first traces of the image begin to come up'.¹² Chemical magic experienced by these photographers is quite substantially different and more wondrous than any claims that cleaning or gardening products had to work like magic. Additionally, the makers of photographic chemicals did not give magical or mystical names to their products, leaving the user to conjure the magic themselves.

The question of home processing as a masculine pursuit was not explored at NMeM, as is often the case in museum displays where space and text is limited. Changes are indicated by the inclusion of a book published in 1950 "*Photography for Boys and Girls*" with a cover illustration of an aproned girl watching as a boy inspects a section of film that he has been developing. Inside the book, there are no similar illustrations and the images included of children composing and taking photographs are all of girls, presumably Pog, Celia and Judy to whom the book is dedicated to. If children could pursue this activity with pocket money, the costs must have declined and the author was making an effort to say that it is not simply the domain of serious adults. Indeed, in anticipation of broadening their sales base, children and young people were directly addressed by chemical manufacturers Ilford.¹³ People taught themselves using books at home, making every mistake possible, perhaps spending a day observing in a professional darkroom as 17 year old Grace Robertson did, arranged through her father who worked at the Picture Post or tutored by a more experienced photographer, as Zoe Dominic learned from Michael Wallace in his darkroom in the garage under his mews cottage in Chelsea.¹⁴

This transition from a hobby pursued by wealthy adults with abundant leisure time to one that could be taken up by children is interesting not only because of the changing financial costs, but also because this was occurred with a parallel development in the presentation of ready mixed chemicals that were simpler and more convenient to use. Kits were advertised with the slogan "No more messy chemicals", a demonstration of how measuring out, mixing and pouring chemicals was considered to be messy and possibly even preventing someone beginning or continuing the practice of home processing. The author of *Photography for Boys and Girls* thanked Ilford and Johnsons of Hendon for help preparing the book, as well as recommending their concentrated liquid products or ready-mixed powder preparations by name, with no mention of the option of making up formulae.¹⁵ Similar to strategies used to promote hardware as simple where women and children demonstrated

11 Dominic, Zoe. "Oral History of British Photography." By Shirley Read (1996)

12 Dominic, Zoe. "Oral History of British Photography." By Shirley Read (1996) track 2 of 8, 12.35

13 Ilford Limited *No. 8 Salesmanship*. The Ilford and Selo Course of Photographic Salesmanship and Service. London: Ilford Limited.

14 Robertson, Grace. "Oral History of British Photography." By Alan Dein (1993) track 10 of 19, start. ; Dominic, Zoe. "Oral History of British Photography." By Shirley Read (1996) track 4 of 8, 09.09

15 Bowler, Stanley W. *Photography for Boys and Girls*. A Junior Teach Yourself Book. Liverpool: English Universities Press Limited, 1950.

how easy and foolproof cameras were to use, the direction of books on home processing to children also highlights the ease of use of these new formulations and kits.

Developing one's own photographs not only gave control over the end product, but could also avoid processors seeing, and judging, the content of the photographs. Social historian Erika Hanna wrote of self-censorship with respect to subject matter, when she discovered a collection of photographs that did not include any of a long term, same-sex partner, contrasted to the use of photographs made to frame and present previous heterosexual relationships.¹⁶ If the photographer had also developed her own photographs would this have allowed her more freedom to portray her long lasting, intimate relationship? Perhaps that person was simply not keen on being photographed, but it is an interesting point to consider especially with the advent of digital photography, where images are instantly available to view without the mediation of any external organisations or individuals to judge and censor. Those photographers who developed images at home did not have to concern themselves with the eyes of others, and coupled with the nude studies were printed in photographic magazines, this lent home developers as a group of users an air of seediness. Not all of those photographs would have been so tasteful. In Kenyon's study of *Amateur Photographer* magazine, he described nudes as appearing rarely, but I was naively surprised at the regularity of nudes and swimwear shots, as well as those that experimented with light and texture of diaphanous fabrics over a nude body.

However, not just amateurs developed photographs at home. A National Trust property in Liverpool, The Hardman's House, is an interesting example of both a home and a photographers' portrait studio business. Chambre and Margaret Hardman had two darkrooms, one in the basement for the business, and another which they named the Barnston darkroom, upstairs near their living quarters that they used solely for their leisure pursuits. Although this duplication of equipment and chemicals may initially seem unnecessary, the space needed to process the portraits may well have prevented the pursuit of leisure photography, as well as providing financial clarification when it came to accounting for the use of consumables. A description of the commercial darkroom as "cramped and cluttered" contrasts with the orderly appearance of the Barnston room and lends weight to the idea of this space as something of a sanctuary that the Hardmans spent most of their free time in.

Using photographic chemicals at home

Developing photographs needed a dedicated space, at least temporarily dedicated, if not a permanently set up dark space. Clean running water was desirable, but not a requirement, and diagrams of rigs that would fit over baths or utility room sinks, then could be packed away were published along with more permanent installations. In the Kodak gallery at NMeM visitors can view a Pepper's Ghost illusion, where pressing a button reveals the transformation of a domestic bathroom into a darkroom. Hobby magazines demonstrated receptiveness to users' different needs and means, and published letters requesting details of modest darkrooms for domestic spaces as well as letters from those who wanted to share the pared down, portable arrangements that home processors had created themselves.

16 Hanna, Erika. "Reading Irish Women's Lives in Photograph Albums." *Cultural & Social History* 11, no. 1 (2014): 89-109.

As well as the space and equipment to develop the photographs, a place to weigh out chemicals, dissolve powders or make dilutions was needed, as well as a place to store all the requisite bottles, mixtures and powders. Cleanliness was very important in getting a good end result, so the usability of the space sought for making up developing solutions was described in terms of being able to wipe down and clear up any spills, to avoid contamination or spoiling the photographic solution, rather than being mindful of other potential users of the space. Some instructions deemed kitchens unsuitable, because they were used for so many different, dirty tasks that although they were inherently easy to wipe up, the risk of contaminating the photography solutions was too high. Utility rooms were preferred, with more limited laundry and hobby uses, or bathrooms, similarly with limited purposes related to becoming clean, their inherently dirty processes left unspoken. Towel fluff was considered the worst contaminant here,¹⁷ which fits the exhortations to housewives that bathrooms should always be scrupulously clean. Under the stairs was another domestic space commonly requisitioned, as were garages. As films, papers and developers were steadily simplified to use and accommodated a less exactitude, instructions became more relaxed and the kitchen was considered fine to use, although a particular cautious user could put some sheets of newspaper down if they thought they might drip or splash anything.¹⁸ When Ilford introduced a new developing chemical Phenitone, one of the advantages they promoted was that it was less likely to stain fingers and clothing than its predecessor metol.¹⁹

As dedicated photographers, the Hardman's chose their property on Rodney Street not only with respect to the city's geography and accessibility to clients, but also with darkroom suitability in mind. Rodney Street is referred to as the Harley Street of Liverpool and the house had formerly been used as a doctors' premises, so sinks with running water were installed throughout, allowing the Hardman's to easily convert one of these rooms to accommodate their pastime. Their private darkroom was situated towards the back of the house and its single, small window could be simply blacked out with a blind. With their permanent darkrooms, the Hardman's stored all their chemicals on wall mounted shelves, in glass fronted cabinets and on shelves under the processing sinks. Photographic chemicals did not encroach on other domestic spaces in this household. However, domestic items did get stored in the private darkroom, as demonstrated by the bottles of preserved fruit lined up with trays and other equipment kept under the sinks.

What was striking about the visible packaging in the Barnston darkroom, was that it was all bottles and jars, there didn't appear to be any paper or cardboard packs. Manuals advised never to keep the chemicals and reagents in paper bags and the professional photographers evidently made sure that their supplies were kept properly. It also suggests that they perhaps preferred to dilute concentrated liquids rather than to weigh and dissolve chemicals. Having finely powdered chemicals floating about in the darkroom air was considered a menace to the production of decent images. I could not spot any scales for weighing dry ingredients, but could see graduates and measures for liquids.

In contrast to this, the collection at NMeM is dominated by paper and cardboard packets, some of which contain bottles, as they would have been retailed rather than as they would have been used. Typical packaging at NMeM is of thin cardboard sleeves around foil wrapped packets of

17 Lilley, Geoffrey. *Make Your Own Darkroom for Colour Printing*. Fountain Photobook. London: Fountain Press, 1962. p9.

18 "How to Use the Johnson 'Do-It-Yourself' Outfit." London: Johnsons of Hendon, c. 1957.

19 "Ilford Phenidone: A Remarkable New Developing Agent." In *Ilford Trade Lit*. United Kingdom: MOSI, 1953.

preweighed reagents, which must be dissolved in water in the order given on the instructions. Or in the case of flash powder, a quantity of tube A to be mixed with tube B. Slim cardboard boxes contain similar foil packets. Also noteworthy on the subject of branded packages is that although the company and brand names appeared, the active chemical ingredients such as metol, hydroquinone, borax do appear. The formulae for these products were readily available, but their existence demonstrates that the convenience of being able to skip weighing out and storing constituent chemicals was appealing to many home processors.

Manufacturing companies were often the ones to highlight the 'tedium' or desire to avoid 'messy chemicals' in their promotional material for new, improved compounded products.²⁰ Johnsons also packaged some of their products quite ingeniously to help the user, for example the lid of a tin doubled as a measure, doing away with having to weigh or mark up volumes for ones self.

A reason for using preparing ones own mixtures was that companies could alter or stop making a preferred brand, so being self reliant avoided this disruption and disappointment. This was also framed in terms of 'independence from monopolistic companies', by the collective operating under the name Photography Workshop in their manifesto statement. They developed an index of substitutes and alternatives from household and industrial products.²¹ This is not to say that users who chose prepared mixtures were restricted in how they used them. Keen home developers who did not want to buy 'barrels of chemicals' but still wanted to personalise their results were free to adjust commercial mixtures with small additions, providing they understood (or learned) what effects the chemicals would have on the print.²²

Evidence of domestic practices, in this case undesirable, can be found in practical photography manuals and magazine articles. The airing cupboard was described as the most frequently chosen place of storage for the bottles of carefully prepared and labelled solutions that the home developers made up. To the author, this behaviour was inexplicable, who advised storing them instead on a windowsill where sunlight could kill moulds that could grow and spoil the solutions.²³ For chemicals that must be used for their purpose of developing photographs, in a specially constructed darkroom, putting them in direct light seems counter intuitive. The question remains though of why the airing cupboard, when any other cupboard would have provided this dark, protective environment without the additional warmth traditionally associated with airing cupboards.

Ventilation was a concern for these chemical users, but perhaps not an overwhelming one especially as the chemical processes were simplified. Historian Bill Jayon documented that photographic journals for amateurs and professionals alike had been urging their readers to ventilate their workspaces properly since the 1890s, and regularly ran articles on health issues to do with improper ventilation, as well as effects on the skin from immersion in solutions. These concerns were not always explicitly related to any specific chemical fumes, but more often referred to "stuffiness"

20 "Ilford Monophen." In *Ilford Trade Lit 2*: MOSI, 1960.

21 Spence, Jo. *Putting Myself in the Picture : A Political, Personal, and Photographic Autobiography*. London, England: Camden Press, 1986. p64-65

22 Hart, Russell. "Soup of the Day: Seasoning Print Developers to Taste." *Popular Photography*, Jan-Mar 1988.

23 Shearcroft, Walter Francis Fairfax. *A Practical Guide to Photographic Chemicals and Their Uses*. 1 ed. London 1942. p35

which would make you sleepy, when the process required you to stay awake to get the best results.²⁴

In 1944, *Amateur Photographer* carried an article on making a home made chemical balance. It opened with a statement that indicated their view of how people used photographic chemicals at home. "Many keen amateurs although they delight in carrying out their own processing never dream of weighing out and making up their own solutions."²⁵ This sentence suggests that kits of prepackaged chemicals to be dissolved in a set order, or ready made concentrated solutions which the user diluted as appropriate were the main way that the chemicals were interacted with, rather than directly buying and weighing out the individual chemical constituents. This is very different to the impression given by Shearcroft's 1942 manual, containing chapters of detailed information on weighing out and mixing up solutions, and possibly demonstrates the diversity of what actually happened. The magazine article's author identified a lack of a suitable weighing machine as the key factor holding photographers back from this stage, not that they did not want to engage with the chemicals for any reason, or that solutions were more convenient, attractive in terms of cost, more readily available or less intimidating or reliable. This one article, presenting a homemade balance, cannot give a representative demonstration of all home developers attitudes and practices, but it is an interesting inclusion in a magazine, which continued publishing through the second world war, and can be considered to have known its audience and their activities quite well.

Where were photographic chemicals available?

Chemists and photographic dealers were where these chemicals could be purchased. *Could they also be mail order?* These chemicals, at least in the purities specified and required for satisfactory results, were only available from specialist retailers, they were not on offer at more general stores such as grocers, ironmongers or supermarkets.

Photographic dealers were encouraged to cultivate rapport with their customers. Ilford published a course in salesmanship, and emphasised knowing about the customers in order to best help them, as well as to encourage sales and repeat custom.²⁶

What about Woolworths? Perhaps this is where kits come in – don't need specialist sales advice or handling/ storage? Packaging total substitute for sales people who would have previously given advice, packaged, assured quality. Photographic chemicals were also heavily branded from early on in the history of photography. Shearcroft urged his audience of 'practical chemists' to "BUY NOTHING BUT BRANDED CHEMICALS".²⁷ The emphasis in instruction manuals, such as Shearcroft's, on purity and thus on branded products, was directed so that the user could be sure they got what they needed and avoided disappointment with poor quality, but perhaps more readily available, substitutes. He gave the example of sodium carbonate, commonly known as washing soda, but strictly separated the menial tasks of washing up and cleaning floors for which a low grade chemical was good enough, from the skilled technical use of developing photographs, which necessitated a finer grade for satisfactory results. His book carried no warning about securing the

24 Lilley, Geoffrey. *Make Your Own Darkroom for Colour Printing*. Fountain Photobook. London: Fountain Press, 1962. p17

25 "A Home Made Chemical Balance." *Amateur Photographer*, May 1944, 71.

26 Limited, Ilford. *No. 8 Salesmanship*. The Ilford and Selo Course of Photographic Salesmanship and Service. London: Ilford Limited.

27 Shearcroft, Walter Francis Fairfax. *A Practical Guide to Photographic Chemicals and Their Uses*. 1 ed. London 1942. p33

photographic grade from being used for household tasks, suggesting that he did not consider this a likely scenario and the household photographer's supplies would be safe from anyone seeking a quantity suitable for cleaning.

The Hardmans glass fronted chemical cabinets display rows of partially used up bottles from photographic chemical specialists Johnsons of Hendon and Kodak, local chemists such as Clay & Abraham on nearby Bold St (where they purchased many of the lotions and medications stored in their medicine cabinets) as well as chemical companies who did not specialise in photographic supplies, such as A. Gallenkamp & Company.

What dangers, if any, are associated with storing or using them?

Shearcroft stressed using dedicated equipment, not reused from kitchen duty and certainly not "chemically filthy" hands.²⁸ However, this is all with an eye to achieving the best possible results, rather than ensuring the comfort or safety of user (and those he shared the domestic space with). Clear labelling of the contents of bottles was also paramount in Shearcroft's instruction, although he did not elaborate on why, leaving this perhaps as self evident that the user should be able to quickly select the correct materials needed for photography, but not considering the non-users in the household and their curiosity or assumptions about the contents.

Although particular types of bottle, Winchesters, were recommended in some manuals to be obtained from chemists, others suggested jam jars,²⁹ gin bottles and other drinks bottles. Gin was suggested for the tendency for it to be packaged in squared bottles, allowing to be easily distinguished by touch in dim light. It was interesting to note that that particular author added a disclaimer that it was not his fault if people drank from the bottle, which should be clearly relabelled.³⁰ Not everyone diligently followed this advice, as an example of a bottle kept at MOSI shows. The reverse of the bottle is embossed with "chest and lung mixture" and the chemists original label of tincture of quinine is still partially visible under the added label and faded pen inscription of "Pot. Bichrom, Hydrochlo. Acid Intensifier".

Having highlighted the potential for accidental poisoning through mistaken contents, this type of mishap did not get reported in national newspapers, unlike the cleaning products and herbicides we have looked at previously. The specialist photographic journals carried news of such accidents as way of informing their the likely users, but the absence of concern in



28 Shearcroft, Walter Francis Fairfax. *A Practical Guide to Photographic Chemistry*. London: Focal Press, 1942.

29 Bowler, Stanley W. *Photography for Boys and Girls*. A Junior Teach Yourself Book. Liverpool: English Universities Press Limited, 1950. p25

30 Mannheim, Ladislaus Andrew. *Straightforward Developing: How to Get the Best out of Your Own Films*. London: Focal Press, 1949. p20

mainstream newspapers suggests that this domestic use of chemicals was not a considered a problem that occurred frequently enough for these papers to educate or mobilise their readers about. This fits with the idea that photographic chemicals were only a hazard to the small number of people using them, that collateral damage or criminal misuse was not believed to be a problem.

Although photographic magazines had run editorials and articles about the dangers of photographic chemicals since the 1860s, and photographers had been connecting a variety of physical symptoms and general discomfort with their use of chemicals, generally in less than ideally ventilated rooms,³¹ methods of safe handling and use of these chemicals are generally not discussed in manuals from the 1930s to the 1960s. A topic that was raised often was the disposal of spent or contaminated solutions, which routinely got special mention due to the tendency to lurk in U-bends and mix to form toxic gases which escaped into the darkroom and poisoned careless enthusiasts. The common-sense solution to this problem was to flush the chemicals away with plenty of water. When users were alerted their need for responsibility and care when handling the chemicals, such as to not smoke, eat or drink in the darkroom, to wash one's hands well, these were all dealt with in terms of obtaining decent photographic results rather than personal safety.

In the correspondence from readers responding to articles about chemical dangers, Jayon detected hypochondria, as well as a tendency for the photographers to become very involved in their work, spending overly long hours in stuffy spaces. Despite the regular appearance of health concerns in these publications, voiced by chemical users as well as magazine editors, they have been given only passing mention in books from the 1930 to the 1970s. Despite this seemingly laissez-faire attitude in instructional books, the manufacturers of photographic chemicals have long been interested in their users' comfort and safety, as can be seen in the promotion of improved chemicals. For instance, in 1941 Johnsons advertised their new chemical Meritol as a replacement for toxic paraphenylenediamine used in miniature photography, to obtain a fine grain. Meritol was available by itself, for photographers to incorporate into recipes, or ready compounded into developers.³²

Black and white processors were regarded as being more likely to "slosh about" in metol, notorious for causing dermatitis, whereas colour processors could not indulge in "such light hearted frivolity" as the chemicals required more respect and certainly the use of rubber gloves.³³

The awareness of skin problems and sensitivity to metol was highlighted in Ilford's publicity for their new revolutionary chemical Phenidone in 1953, which they positioned as a substitute for metol. Phenidone did not require the 'obnoxious' caustic alkali, was described as 'one of the least toxic' and 'unlikely to cause dermatitis with normal users' as well as being usable by those already suffering from metol poisoning.³⁴

In the 1970s, evidence of greater concern about photographic chemicals can be seen, when they were compared and found equivalent to other household chemicals and hair dyes. However, the replacement of certain chemicals with others is probably a better indication of concerns about safety, as harm to health was certainly a consideration for some products that were introduced to amateurs and professionals. Although longitudinal studies of photographic development workers,

31 Jay, 1981. "Dangers in the Dark"

32 Chemist, Johnson & Sons Manufacturing. "Advertisement." *The Amateur Photographer* (29 January 1941): 6

33 Lilley, Geoffrey. *Make Your Own Darkroom for Colour Printing*. Fountain Photobook. London: Fountain Press, 1962.

34 "Ilford Phenidone: A Remarkable New Developing Agent." United Kingdom: MOSI, 1953.

exposed daily and for longer periods of time than hobbyist amateur users were likely to be, did not show any marked susceptibility for cancers, or other afflictions, there is a more generalised caution about the use of chemicals, especially those that smell strong, or have visible effects on skin. These visible effects were limited to reddening, itching, scaling, irritant types of interaction, despite the fact that hydroquinone was known to lighten skin following industrial accidents in the 1930s and 40s, and used medically as well as cosmetically to lighten skin. Either the authors of instructions about photographic chemical hazards assumed the common sense behaviour of hand washing so that this effect was not considered relevant to mention, or they focussed on an audience of white users. Even despite knowing that certain chemicals were potentially dangerous, some were considered too useful and without adequate substitutes to be given up. Instead, users were warned to use with "caution" or "extreme caution" in the case of developer component hydroquinone.³⁵ Eventually, when replacement of hydroquinone with ascorbic acid had been thoroughly investigated and was deemed suitable, the substitution was described in terms of greater environmental friendliness, rather than avoidance of personal harm.³⁶ This discrepancy is due to the different attitudes of authors towards the risk, where sensible behaviour and protective equipment was considered to effectively negate any chemical problems, especially when the chemical risk, such as human cancer through exposure to hydroquinone, were not certain.

This can be demonstrated by the availability of company representatives to advise by telephone or letter, as well as to learn from their users' actions and to feed back any relevant findings to improve warnings to other users. This was especially relevant when experimental or creative users mixed media, causing unanticipated chemical reactions.³⁷

Margaret Hardman's life ended in 1970, when she was 61, by breast cancer, *is there any mention of any pondered connection in any of the documents?* The collection of interviews conducted for the British Library's Oral History of British Photography documents experiences of respiratory diseases, cancers and leukaemia, but although some artists attributed their susceptibility to disease to long hours and hard work, photographic chemical exposure does not seem to have been singled out as a contributory or aggravating problem.³⁸ American photographer John Pfahl endorsed the Overexposure project to provide information about possible toxicological risks that amateur and professional photographic processors faced, with an open letter that gave his personal experiences of general malaise related to chemical sensitivity and non-Hodgkins lymphoma which he acknowledged as possibly attributable to the combination of toxins he voluntarily exposed himself to through his passion for processing photographs.³⁹

35 Rempel, Siegfried, and Wolfgang Rempel. *Health Hazards for Photographers*. New York: Lyons & Burford, 1992.

36 Anchell, Stephen G. *The Darkroom Cookbook*. 1 ed. London: Focal Press, 1994 p88

37 Fulks, Michael "Is your darkroom safe?"

38 Spence, Jo. "The Picture of Health." *Spare Rib*, no. 163 (1986): 19-24.; Spence, Jo. "Oral History of British Photography." By Val Williams (1991).; Dominic, Zoe. "Oral History of British Photography." By Shirley Read (1996).

39 Shaw, Susan, and Monona Rossol. *Overexposure : Health Hazards in Photography*. 2nd ed. (1991) New York, N.Y. Saint Paul, MN: Allworth Press, p11-12

Photography enthusiast Paul Godfrey reminisced about his experiences with flash powder in the 1970s. Though a network of contacts, he was given a Horlicks jar containing flash powder made up by an industrial chemist who worked at an oil company. He and other enthusiasts at an adult evening class had fun trying out the flash powder, but later panicked about keeping a jar of chemicals that he believed could spontaneously combust. In an effort to safely dispose of it, he tried to wash the powder down the sink, which clogged, and he subsequently found out that damp powder was more dangerous than it was when it was dry.⁴⁰ Indeed, historian of photography Bill Jayon wrote that it was not just amateurs who could become nervous about keeping such chemicals, as a fatal industrial accident was caused by flash powder manufacturers washing their chemicals down the drain, in an attempt to rapidly dispose of them.⁴¹ Although the incident Jayon recounted occurred in 1889, both accounts show that the users' partial understanding of the chemistry caused worry and the desire to no longer have or to use those chemicals. As in the use of any domestically employed chemical product, there is no requirement for the user to fully understand how it works in order to get satisfactory results, but a more complete understanding may help people to avoid accidents.

Would this be anything to do with the masculinity and invincibility of young men? If more women were pursuing this hobby, would there have been a different emphasis on personal health effects?

Was this danger removed or reduced by the development of kits or readymade solutions?

In fact, in NMeM's Kodak gallery flash powder and magnesium are the only photographic chemicals displayed from the period 1930s to the 1980s. The packaging in the shop front of the dispensing chemist, dealer in photographic materials and pure chemicals, shows only films, papers and cameras. Off public display, but still available to visitors to the Insight collections centre, designed to make accessible the vast number of items that are not displayed in galleries, are samples of packaging for developer and fixers, along with bottles that once contained chemicals such as pyrogalllic acid, displayed in a cabinet in one of the object stores.

A visit to a locked chemical cabinet in another museum's storage area revealed several bulging tins, taped shut, apparently as a demonstration of why photographic chemicals tend to be disposed of and the only the packaging, inert accessories such as scoops and measures and instructional inserts retained. However, powders and solids such as developer, flash powder and magnesium appear to be less threatening and therefore retained, yet their catalogue records list their hazards as "unknown", "environmental", "oxidising" and "explosive".

Expertise and Risk Perception

The question of perceived dangers from photographic chemicals is certainly one very much associated with greater awareness of unknown effects from environmental chemicals in general. Photojournalist Elisabeth Chat was working in the darkroom when she went into labour with her first child in 1952, having worked throughout her pregnancy and did not detail any concerns or special precautions that she took, instead relishing doing what very few women were doing at the

⁴⁰ http://www.photomemorabilia.co.uk/Johnsons_of_Hendon/Johnsons_FlashPowder.html

⁴¹ Jayon, Bill. "Dangers in the Dark." Composite article: First published in two subsequent issues of The British Journal of Photography, 3 and 10 October 1980; the section on poisons was published in Phoebus: A Journal of Art History in 1981

time, as well as the idea that her grandmother would have been horrified.⁴² Even later, a particularly peevisish article in *Spare Rib* did not mention any health effects related to photographic chemicals, despite being a magazine which usually took special care to note any relationships however tentative to cancers and reproductive disorders.⁴³

Dr Richard Henry typifies the response of a laboratory trained chemist to concerns from non-specialists about chemical risks. His 1986 second edition of his re-investigation of the fundamentals of black and white photography included a new chapter, or rather a tirade, rubbishing a number of publications from the 1980s concerned with the potential hazards of photographic chemicals. His attitude was that safe laboratory practice was sufficient protection from harm, which for a book that was not necessarily targeted at only laboratory workers is unfair to his readers without this formal training. He suggested that women could wear labcoats or aprons if they wanted to, without going further into why they would require different protection from that used by men, presumably they were imagined to be more fashion conscious than men and might wish to protect their clothes.⁴⁴

Are these dangers related to their withdrawal/restriction or concealment?

Where there any public calls for action? *No? useful to compare to other chemicals where people did feel outraged that they were available.* Why, when these chemicals could be misused with fatal consequences, was there not any public concern? Could this be to do with the perception of the users themselves, ie nerdy, not a threat, hobbyists, competent? What about the list of prohibited chemicals re sabotage?

Could it be that the number of people requiring the chemicals was so low as to be unprofitable to continue? Is this a supply and demand problem?

Another factor to consider is the type of film used, and the needs associated with developing it. The introduction of colour film certainly had implications for the chemicals required, and it created even more interest in kits suitable for this more complex process. The continual improvement of camera film meant that developing techniques also had to adjust. This shows that it is not simply the availability of chemicals that is a factor, but also the suitability of films for amateur processing methods.

One of the products that should have been subject to scrutiny at the point of sale, at least during the second world war, was photographic flash powder. It was included on the list of Prohibited Chemicals compiled by the explosives group, discussed among home office officials and circulated around retailers of chemicals. It stands out on the list because flash powder is a mixture, not a chemical element, nor a compound. Also on the list was potash of nitrate, or potassium nitrate

42 Chat, Elisabeth. "Oral History of British Photography." By Alan Dein (1994) track 5 of 8, 26.39

43 Gilbert, Stephanie. "Developing Your Films." *Spare Rib*, no. 26 (1974): 30-31.

44 Henry, Richard J. *Controls in Black and White Photography*. 2nd ed. Boston: Focal Press, 1986.

which was an ingredient in photographic flash powder. Magnesium powder, which when ignited burned with a bright white flame, good for illuminating photographic subjects, was not listed separately. However, flash powder itself did not seem to be the subject of much further discussion, its place on the list was not contested in the archived documents nor was any further information offered about the prevalence of its normal use, or the likelihood of it being used by a saboteur who had so many products to choose from.

By the outbreak of the second world war, flash powder was already being replaced by flash bulbs which did not rely on a small fire and explosion to generate brightness. However, flash powder was still used by some amateur photographers until the 1960s, so this proposed tightening of sales might be expected to have been discussed in the press. Sales were not stopped, but the retailers were urged to consider the amount they were selling and to whom. In all probability, the amount photographers bought at a time were not large enough to constitute a significant threat. Tins of Johnson flashpowder contained 1, 4 or 8 ounces. 1 ounce of flash powder, could last around 43 portraits of individuals, as it was only used in small amounts at a time around two thirds of a gram. Larger groups demanded more illumination, using around 6 grams of powder. However, as even using these small amounts could be dangerous, and caused even experienced, frequent users of it to be wary of their safety, there does seem to be sense behind the concern about the use of flashpowder in sabotage. As described earlier, dampness was a particular problem especially if the powder was damp, which caused it to detonate "like a small grenade" rather than provide light. At the outbreak of hostilities [photographic flash powder] should be dealt with by legislation or Order to prevent general availability. List of 'prohibited chemicals'. *When was flash powder in use? Suspect that it was early only. Bulbs in use by 30s, but only replacing flash powder by 1950s.*⁴⁵

Cleaning Photographic Negatives

An interesting example of awareness about dangers of chemical use played out in the pages of *Amateur Photographer*, after an article suggested using CTC but did not mention any precautions. In an exchange through the letters pages readers who, at least in the edited letters we see published, did not identify themselves as being any other type of expert or user such as trained in physiology or toxicology, conversed about their perceptions of the chemical. Marcus Rowland, writing from London, warned others of the danger of 'an extremely dangerous chemical', of its potential to be absorbed it through the skin, of the and to form phosgene if fumes were inhaled through a cigarette.⁴⁶ Paul Peronat from Sunderland poo-pooed this caution, identifying the previously listed

⁴⁵ <http://photography.tutsplus.com/articles/a-brief-history-of-photographic-flash--photo-4249>

⁴⁶ Rowland, Marcus L. "Chemical Threat from Cleaning." *Amateur Photographer*, 14 July 1976, p82.

dangers as relevant for chloroform, but not CTC, saying photographers only needed to worry if they had glue sniffing children who might damage their kidneys from enthusiastic solvent abuse with CTC. This letter was interesting, as he also claimed that CTC was stable, not forming phosgene, putting it on a par with nail varnish remover (which if he meant acetone, is rather good at starting fires) or spot remover, which in many cases was actually CTC.⁴⁷ Rowland got the last word in this exchange, where in the final letter printed on the subject he conceded that chloroform did share some of the same characteristics, but that neither should be used in poorly ventilated situation or by people who were smoking. He then linked CTC and its use in dry cleaning to deaths following inadequate airing of treated garments, a phenomena that had not emerged into the public domain in the research I carried out. However, in his direction of readers to the Institute of Science and Technology publication "The care, handling, and disposal of dangerous chemicals", a document that the average citizen would not have much special cause to read,⁴⁸ but as a school laboratory technician he encountered this publication as part of his working life, and was able to apply the information to his hobby.⁴⁹

Hanna 2014 p94 Usage and ownership were gendered. Technical photography was geared towards men. 1950s symbol of the Dublin Amateur Camera club was monochrome depiction of an oversized man with tripod and camera straddling O'Connell St, .. Ever cheaper lighter and easier to use cameras of the amateur market were increasingly marketed as being tailored to the needs of women. 1920s ads in The camera featured many new techs aimed at women, to photograph small children, represented photography as key part in constituting and solidifying the family. Featured articles by a female photographer 'Focal Plane Jane' who gave advice to female photographers. Marketing simple techs towards women was followed when colour film was introduced, often seen by photography enthusiasts as not being a 'serious' medium, it was primarily marketed as a tech advance for domestic 'snaps'.⁵⁰

Photographic Chemicals and how to make them.
W. TAYLOR, (Photographer)
London : Iliffe & Sons, [1904]

47 Peronat, Paul. "Glue Sniffing and Chemicals." *Amateur Photographer*, 28 July 1976, 81.

48 Rowland, Marcus L. "Dangers of Carbon Tetrachloride." *Amateur Photographer*, 11 August 1976, p83

49 Personal communication, M. Rowland email 27 September 2014

50 Hanna, Erika. "Reading Irish Women's Lives in Photograph Albums." *Cultural & Social History* 11, no. 1 (2014): 89-109.